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ABSTRACT

Effective research on issues of rural development is increasingly important in a time when inequalities among people in rural areas is widening. Criteria of time-cost effectiveness, policy effectiveness for rural development, and contribution to sociology must be balanced by rural social scientists in their research design decisions. When five generally recognized types of research are examined by these criteria, only one stands up--systems analysis. Procedures built around description of conditions, public opinion polling, evaluations of programs, and basic academic research fail to meet some of the criteria. Systems research, however, corrects for many of the weaknesses in other types, and a policy research paradigm originating from systems analysis can be developed with specific reference to rural development. The paradigm is applied to Federal, state, and local levels of jurisdiction affecting rural development; it allows continuous monitoring of key variables so that each jurisdictional level can simulate alternative futures, thereby aiding policy makers in their decisions. Because of more precise focus, the paradigm can also produce greater cost effectiveness with research monies, facilities, and talents; its emphasis on trend analysis on a wide range of interacting variables can make a major contribution to social science. (RS)

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A Multi-Level Policy Research Paradigm: Implications for Rural and Regional Development

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A Multi-Level Policy Research Paradigm:
Implications for Rural and Regional Development

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ABSTRACT

Five types of identifiable policy research procedures are examined in the light of three criteria for policy research. The five types include descriptive studies from secondary sources, public opinion polling, evaluative studies, basic research, and systems analysis. They are subjected to the criteria of time-cost effectiveness, policy effectiveness, and contribution to sociology. The first four types of research fail to meet at least some of the criteria, often by a wide margin. A paradigm following systems research is then developed with specific reference to rural development. Its inputs are defined as governmental policies and agencies; its throughputs as public and private institutional structures; its outputs as objective resources produced by the structures and as the subjective values of individuals in their access to the resources; and feedback as the legislative process producing the policy inputs. The paradigm is then applied to several levels of jurisdiction affecting local rural development, namely, the federal, state, and local levels. Through continuous monitoring of key variables following the systems paradigm, policy research units for each jurisdiction could simulate alternative futures for the processes in their jurisdictions, arriving at findings relevant to policy-makers in their attempts to discover ways to satisfy their populations. Finally, the three criteria are re-examined as favorable to the multi-level policy research paradigm.

A Multi-Level Policy Research Paradigm:

Implications for Rural and Regional Development

by

Paul R. Eberts and Sergio Sismondo*

A major issue facing rural sociology is the relation of its research program to rural development. The issue is particularly pertinent to those in Land Grant Colleges and Universities because their research is intended to "serve the rural people" of their respective states. Indeed, the people in the most rural areas are suffering increased inequalities over time as compared generally to those in metropolitan areas (cf. Eberts, 1974, XV). Consequently, increased research and increased effectiveness of this research on issues of rural development for relatively deprived localities are indispensable. Such mandates necessitate balancing at least three criteria in research design decisions of rural social scientists:

1. Cost-effectiveness: whether they have the time, monetary resources, and allied facilities to execute the research properly;
2. Policy-effectiveness for rural development: whether the research will be useful to policy-makers as they devise local, state, and national policies for the most deprived rural localities;
3. Social science effectiveness: whether the research will use the best of the researchers' abilities and contribute to accumulation of knowledge in the social sciences.

Although a great many research decisions seem unavoidably ad hoc (e.g. "to produce"), in order for these three criteria sets to be balanced, an overall conceptual scheme would be instrumental. The scheme must deal explicitly with the three criteria, and focus the substantive issues on which decisions must be made. The following scheme is intended to contribute to this decision process. Its explication requires consideration of: a) an initial definition of rural development; b) types of policy research available; c) elaboration of the multi-level policy research paradigm; and d) usefulness of the paradigm for rural and regional development research decisions by the above criteria.

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I. RURAL DEVELOPMENT.

Rural development must be defined in terms useful to both policy-makers and social scientists. Policy-makers must find the definition meaningful in their deliberations with each other and in discussions with their constituents. Social scientists must be able to adopt and interpret it in their research operations. The definition must be readily convertible to a dependent or effect variable (or set of variables) in research in such a way that its independent or causal variables can be determined. If the definition is not "readily operational," -- i.e. if indicators cannot be readily found for it and for potentially explanatory variables in ecologically and politically meaningful units through statistical techniques -- its definition would be much less useful to researchers.

The definition given in the Rural Development Act of 1972 seems to meet these criteria and constitute a useful starting point. It states, in effect, that rural development refers to improvement in the well-being of people in rural areas, and, more specifically, to improvement in jobs, income, services, and resource management. Because the policy-makers made the statements, we can assume they are meaningful to them. The concepts of well-being, jobs, income, services, and resource management are familiar to the disciplines; indicators for their changes over time are also quite possible to construct. Although we may quibble with the generality of the concepts, and perhaps even with the ultimate meaning of the definition underlying the concepts, it is probable social scientists can adopt them as critical dependent variables in their research systems. In any case, as an initial definition it would seem that these concepts would also be deterministically tied to other concepts more explicated by various disciplinary theories of rural development. One principal role of social science will be to determine optimal manipulations of other societal variables which will lead to the intermediary outputs specified by the legislation (i.e. well-being, jobs, etc.). And furthermore social science will be responsible for selecting means that are both cost-effective and consistent with societal objectives other than those specified by this legislative domain (i.e. civil rights, economic growth, income maintenance, etc.). Indeed, a thorough analysis of means toward such objectives (and of independent variables determining such outcomes) might suggest a social science re-interpretation of the legislative commitment in terms of the enhanced capacity of individuals and institutions in the most deprived localities to interact proactively with the changing variables of their physical and social environments so

as to maximize the life-style options available to them. (Or, concomitantly, in terms of the enhanced capacity of communities to provide the means for individuals to do so. Cf. Eberts, 1975, XVIII and Eberts and Sismondo, 1975, XXI).

II. TYPES OF POLICY RESEARCH.

Five identifiably different types of research are generally recognized by social scientists and interpreted as useful to policy-makers. These include:

1. Descriptions of conditions,
2. Public opinion polling,
3. Evaluations of programs, agencies, or the like,
4. Basic academic research,
5. Systems analyses, modeling, gaming, projections, and simulations.

Descriptive research derives largely from the needs of policy-makers to quantify situations and problems so that the magnitude of programs and budgets may be estimated. Its primary form is to gather information in efforts to answer variants of the question "Which people have which needs?" Answers are sought largely through surveys, analysis of secondary data, and analysis of administrative data. Its general format is to seek particular answers to questions of the type, "How many people live under such specific conditions?" For instance, How many people are in poverty? How many of them are old? Young? Married? Divorced? How many children do they have? How many are eligible for a program being considered? How many for an alternative program? And what do these figures tell us about the projected cost of the program under consideration? In this sense these types of research focus the issues, heighten awareness, and perhaps mobilize both citizens and policy-makers to action on relevant issues.

Public opinion research answers variants of the type of question: "What do people really want or need?" This may be done at various levels of sophistication -- everything from a public hearing, reading and analyzing "letters to the editor," "talking to a lot of people from different walks of life," to systematic surveys and polls. The data may not only seek answers in terms of documenting the key frustrations of people, but also may explore preferences for various alternative means of alleviating these frustrations.

These types of research fail to meet several of the criteria for policy research initially established above. First, such research seldom contributes to cumulation of knowledge in the disciplines. Since most of its information is presented on standard variables in basic cross-tabular form, it contributes little to theory, model-building, statistics, or even measurement or other "methodological" considerations. Often it is considered quickly out-dated and not even used in subsequent time-studies. Naturally many such studies are "intended" to have significance beyond the basic information. But good intentions have a peculiar way of getting lost in file drawers.

This type of documentation, it should be noted, has been the "stock in trade" of rural sociologists and rural sociology departments since they were founded. The rationale is, "before anything else is done, we must assure the situation is documented." The unfortunate part of this history is that often the survey is the only part of the research completed. Moreover, there is remarkably little information in the research literature on what should be done after the survey is completed. It is assumed that policy-makers have the knowledge, technology and expertise to process such findings to satisfy their information requirements. In any case, up to now, no systematic techniques have been developed for disposition of such types of research, or for its transformation into effective policies, programs, or budgets. The fact is that surveys by themselves are incomplete, and sometimes misleading as well as potentially controversial. And because they seldom get to root causes or issues, they often raise as many problems as they solve, and in this regard are often not perceived as cost-effective.

Although social science evaluation research has recently become more popular with policy-makers, it too is found wanting on several of the criteria. By attempting generalization as well as through innovative techniques and theory, it can contribute to social science disciplines.

It should be noted that most often evaluative research is completed after the program evaluated has been terminated. Consequently, most research reports based on it are of little use to the people who are engaged in the project while the program is still underway. Indeed, often social scientists are brought into the research process only after

the program is launched, thus nullifying much of the potential for using important aspects of experimental design in it. Comparative standards of evaluation are seldom included in the research, nor are the rigorous conditions of experimental design, with its multiple control groups and "over-time" observations. Contaminating conditions are virtually inevitable. In addition, a common lament among evaluation researchers is that most of their reports are filed away in obscure places, unread by policy-makers, or by key advisors to future programs. Such a routine truncates both the accumulation of scientific knowledge and the accumulation of policy knowledge (thus breaking away from an important characteristic of science itself). Without a tradition for accumulation each new program tends to re-invent the proverbial wheel, accumulating mistakes rather than effectiveness in policy.

In the last analysis, the fundamental problem of evaluation is that it deals with the past and is constrained by the requirement to focus on that past. This is a true impasse for the social scientist. If he concentrates uniquely on the program being evaluated he will be accused of blindness and lack of imagination; but if he examines true alternatives he will be accused of not abiding to his terms of reference. The real world, on the other hand, changes sufficiently rapidly to render findings of the past unimportant -- social, fiscal, institutional parameters change, and so do attitudes, expectations, and behaviors of people, giving no assurance that dissections of historical events are particularly valuable to designs for the future. It is for all these reasons that evaluative research has come to be known as reactive research; it deals with whether we should have "more or less of the same," as opposed to what we should have to modify or replace in "the same old things."

If the program is judged successful, policy-makers are likely to reduce its budgets in order to determine if they can do the same thing with lowered financial support. If it is judged unsuccessful, the program will likely be abandoned. Under either condition, directions for new programs will probably not be derived from the old.

By its very designation basic academic research fails to meet the second criterion in our initial list, namely, it often has little to do with the concerns of policy-makers. Policy-makers must be presented with at least some variables which are open to influence by their policies. Such policy manipulable variables are often deliberately shunned by basic

researchers. Basic researchers seek universal verities. They seek "effective" parameters for explaining behavior no matter what they might be. Policy-makers recognize (or at least believe) that only certain things are possible at any given period, and therefore, limit the range of parameters to be used. Thus, key variables in basic research may be of little interest to policy-makers. From the standpoint of policy-makers basic research is generally not efficient in recognizing policy-manipulable relations. Typically basic research requires too many additional assumptions to translate it into policy.

Review of the generally recognized types of policy research, therefore, shows that each of the first four when examined alone has a considerable number of weaknesses. Because of what we say here, we do not expect that social scientists will desist from engaging in these types. Nor should they. But we do believe that a variant of systems research tends to correct for many of these weaknesses, and wish now to explicate it in some detail.

III. THE MULTI-LEVEL POLICY PARADIGM.

The multi-level policy paradigm, as indicated above, originates from systems analysis. Crucial questions in using systems analysis revolve around the nature of the variables in each of four general categories: inputs, throughputs, outputs and feedbacks. According to philosophy of science criteria, an adequate scientific scheme must have a minimum number of general categories, yet be sufficiently specific and empirically supported not to be misleading. In order to be useful to policy-makers, major independent variables should include some which are directly controllable by policy-makers. Moreover, it should meet the three criteria specified above, and show how the policy research process interfaces with other processes of the social system. When it meets these criteria, then it may be called a policy research paradigm (cf. Eberts, 1972, VIII; Sismondo, 1973, XIII).

Another criterion is that the paradigm must be appropriate for use by public policy-makers as they deal with their problems in political jurisdictions. In other words, the units of analysis for which the paradigm is applicable are macro-units. Macro-units are geographically bounded political jurisdictions, inclusive of all other possible social sub-units within their boundaries, and which contain a (policy-making) entity within it having legitimate responsibility for the well-being of all other social units within it (cf. Eberts, 1972, VIII). Thus, the size of these "macro-"

units can range from nation-state-society down to a village.

The paradigm depicted in Figure 1 meets these criteria. Inputs are the policies set down by the laws of policy-makers, and implemented through agencies, programs, and budgets. Throughputs are the public and private institutional structures which are the major causal influences on most everything else that occurs in a social system. Outputs are the objective resources produced in the unit, as well as the subjective values (including general morale) and utilities held by the sub-units (including people) within the macro-unit. Feedback is through the political process itself. On the basis of values and utilities held by associations and individuals. pressure and lobby groups as well as political parties form and compete with each other for promotion and attention of legislators' endorsements. The legislators convert their considerations of these competing claims -- often through trade-offs -- into laws and policies, which become the inputs for further iterations through the system.

The solid arrows in Figure 1 indicate that, as in all systems analysis, inputs (policies) help determine structural changes (throughputs), which determine resource changes (outputs), which iteratively determine legislatures (feedback) and their policies. Since some might claim that the arrows out of and into "structures" and "resources" should all be two-headed, indicating a reverse flow of information and influence, theoretical problems may be raised. The problem is intuitively resolved through the concept called "resonance" (cf. Sismondo and Eberts, 1975, XXI). Resonance recognizes mutually supporting phenomena analogous to those that occur when sound waves are reflected from the walls of an auditorium while an orchestra is playing. Indeed, these sound waves sometimes reverberate in such a way as to distort or enhance the waves coming from any given instrument. Nevertheless, it is absurd to assert that the auditorium's walls are causing the instruments to play -- the principle actor is always identified. The possible breakdown in the analogy is that the public or private institutionalized structures in the macro-system are doing the playing, and sometimes are successful in manipulating public agencies. In most cases, however, their influence is minimal compared to the influence of legislators on the same agencies. A similar argument holds for the relation of structures to resources. The loop from resources to structures is much less influential than the influence of structures on resources. Thus, we feel the direction of influence of the arrows is generally compatible with systems analysis.

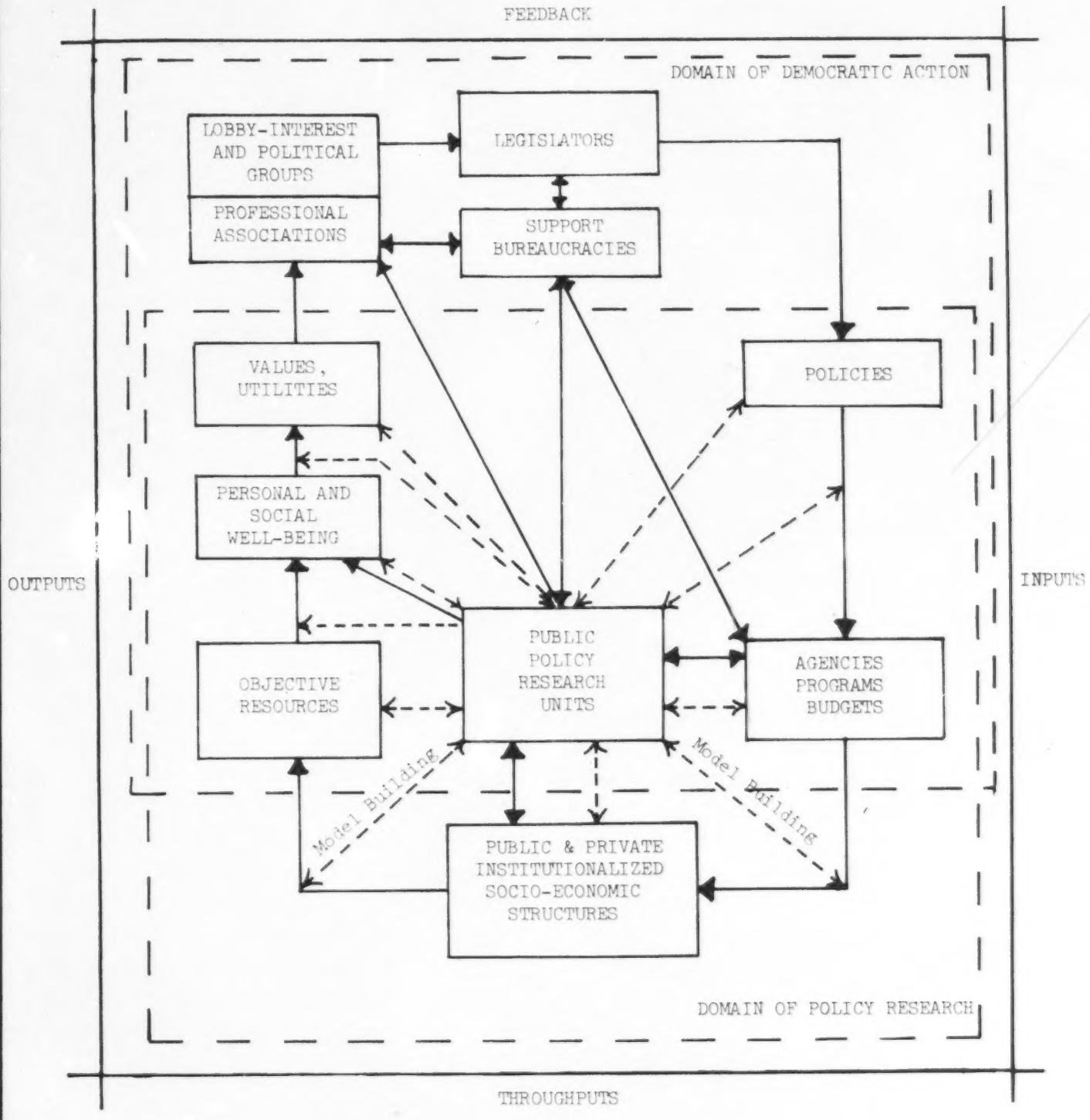
Figure 1 also includes a policy research unit, which in itself is a variable, and which is integrated into relations with other variables. The public research unit monitors the most "effective" variables in the system and constantly builds and up-dates models of their relationships to each other. It then widely disseminates the findings of these models throughout the system to enable more empirically supported and theoretical assessments of various policies and programs. Such information would be useful by appropriate people in the support bureaucracies of the legislators so that they can evaluate program effectiveness for their policy deliberations, in agencies so that they can more effectively implement the intents of policies, in structures so they can more accurately assess the "state of the system" and modify their policies appropriately, and, of course, by citizens, lobby and pressure groups, and political parties so that they also can re-appraise their positions on issues.

It should be noted that Figure 1 is divided into two large, overlapping sections, the Domain of Policy Research and the Domain of Democratic Action. They overlap because people and their values, agencies and programs, and the policy research unit are integral to both domains. They are seen as endogenous variables in units, both acting and being acted upon. An important observation, however, is that the research unit does not monitor or build models on the relations of lobby groups and political parties to legislatures, nor does it monitor or build models on the relations of legislators to policies and laws. A public policy research unit provides duly constituted legislators with the information they need on the effectiveness of current policies and the potential effectiveness of suggested policies for achieving the satisfaction of their citizens' values and utilities. On the other hand, a technocratic vision short-circuiting election-appointment-decision-election routines is inimical to our vision of an open, participatory and self-consciously political system, and an established policy research unit compatible with it.

Policy research is conducted largely at the macro-unit level of analysis, although to some extent it incorporates the other forms of policy research described in Section Two above.

The systems analysis approach is compatible with path analysis, where both direct and indirect effects of variables on each other can be assessed. Thus, a well-being output, W_1, might be a direct result of certain objective resources, R_1 and R_2, which in turn result from several structures, S_1, S_2,

Figure 1. General Flows of Major Influence and Information in Dev... ment Processes: The General Policy Paradigm



→ Lines of communication and/or influence

- - → Proposed lines of research monitoring and/or model building

and S_3, one or more of which may be directly influenced by government agencies, A_1. Presumably, therefore, if a number of macro-units were monitored, a set of regression equations could be written to express these relations. Thus,

$$\Delta W_1 = a + b_1 \Delta R_1 + b_2 \Delta R_2 + u \qquad (1)$$

$$\Delta R_1 = a + b_1 \Delta S_1 + b_2 \Delta S_2 + b_3 \Delta S_3 + u \qquad (2)$$

$$\Delta R_2 = a + b_1 \Delta S_1 + b_2 \Delta S_2 + b_3 \Delta S_3 + u \qquad (3)$$

$$\Delta S_1 = a + b_1 A_1 + u \qquad (4)$$

$$\Delta S_2 = a + b_1 A_1 + u \qquad (5)$$

For a number of such equations, matrices of relations between sets of variables on given units can be created. Table 1 presents part of a possible matrix. The cells in the matrix could contain one or more of several possible statistical terms -- the sign of the relation between the variables, the b, beta, r, R-square, F, etc. Each of these terms contributes its unique information to researchers, and through them to policy-makers. Moreover, statistical systems similar to these underlie the reasoning and mechanics behind most simulation systems, which are essential for estimating indirect effects of variable changes, particularly, the indirect effects of alternative policies.

Accurate simulations, or their functional equivalents, are the goal of systems analysis. Through them, policy-makers can project alternative futures in order to obtain assessments of likely outcomes of different potential policy decisions. Naturally, the quality of such projections depends upon the nature of the variables in the relationships. Some are very easily and accurately quantified while others are not. Two (jobs and income) of the four "operational definitions" of rural development have obvious indicators, while indicators for services and resource management are not standard. Since certain statistical techniques can use variables based on nominal scales, quantification of the latter two variables is at least imaginable. Similar considerations can be made for structural and agency variables. Although initially the quality of the projections may not be all that is desired, continuous monitoring along these lines should produce considerable cumulation in expertise for handling the matrices in order to obtain insights on an increasingly wide range of problems.

It should be noted that the problem of "number of observations" raises some technical problems in macro-analysis -- too few cases, and especially an N of 1 (if only a single locality would be monitored) may greatly handicap the analysis. A possible solution to the problem would be for a large number of "similar" social units to regularly exchange information with each other on their research. Not only would each one then have access to a wide range of experiences and possible innovations, they would be forming data systems for testing a wide range of potential policy manipulations. It might be possible, for example, for state agencies -- perhaps those at Land Grant Institutions -- to serve as depositories for such data. Indeed, over a period of years such interchanges and experience would undoubtedly produce major changes both in types of indicators for variables as well as the "effective" variables themselves (cf. Eberts, 1971, III; Sismondo, 1973, IX).

Some special problems arise in the policy paradigm when the complexities of multi-level relations are added. In essence, Figure 2 is an extension of Figure 1, and recognizes that the policy paradigm is appropriate for a number of macro-units and their interrelations. That there are only two more tiers is mostly a matter of convenience. Although most counties are nested within two tiers above them, some political jurisdictions have more. Each jurisdiction has its own capabilities and functions, most of them carefully defined by the more inclusive jurisdictions of which they are a part.

The three planes, however, do not constitute systems independent of each other. Interactions are of two categories. Federal programs and budgets also influence state programs and budgets, state structures, and outputs of localities. And at the third level, federal programs influence local programs and budgets, local structure, and outputs for households or people. Examples of each one of these influences can be thought of readily. Aid to Families with Dependent Children is an unambiguous example of the latter kind, whereby federal budgets directly determine outputs for people. State programs and budgets also have direct consequences at local levels, be it upon programs and budgets, local structure, and quality of life outcomes. The creation of a university is an example whereby a state jurisdiction intervenes in local budgets, structure, and people's outcomes. The second category of interaction is the democratic feedback system. Note that all elections emanate from the most disaggregated level, symbolizing that the major objectives of policy, at whatever level, are tied to outcomes

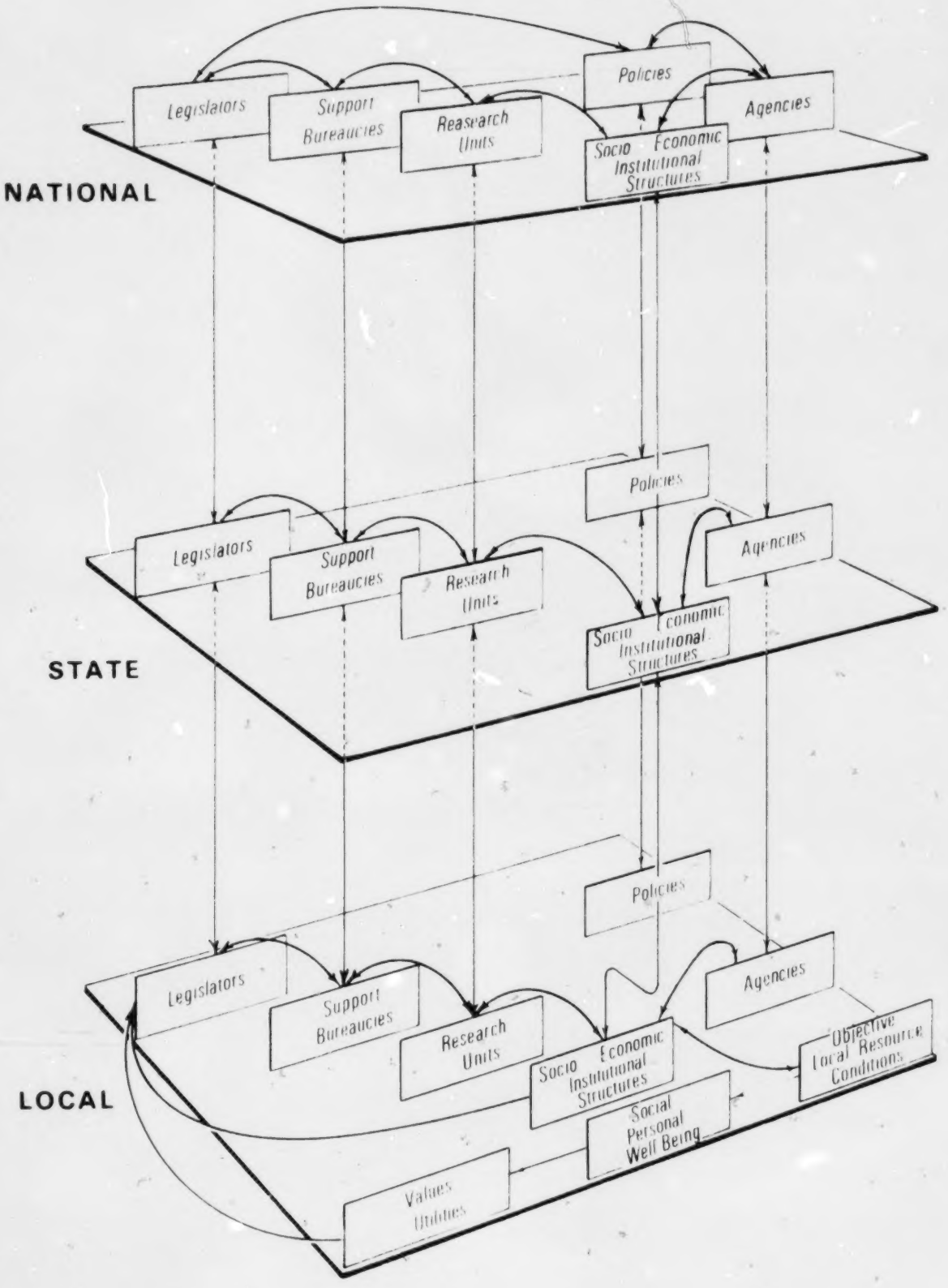
Table 1. Matrix of Variable Relations for Policy Impact Analysis

POLICY INPUTS AND STRUCTURAL THROUGHPUTS

IMPACTS ON OUTCOMES		Sets of Policies			Sets of Agencies			Sets of Structures						Sets of Resources			
		P_1	P_2	P_3	A_1	A_2	A_3	S_1	ΔS_1	S_2	ΔS_2	S_3	ΔS_3	R_1	ΔR_1	R_2	ΔR_2
Sets of Agencies	ΔA_1																
	ΔA_2																
	ΔA_3																
Sets of Structures	ΔS_1																
	ΔS_2																
	ΔS_3																
Sets of Resources	ΔR_1																
	ΔR_2																
Sets of Values	ΔV_1																
	ΔV_2																

10a

Figure 2. General Flows of Influence and Information in Development Processes Interrelating Federal, State and Local Levels: The Multi-Level Policy Paradigm



for individuals. (Other feedbacks are also institutionalized: the councils of mayors, the Governors' conferences and so forth, completing the diagram.)

The first type of interaction represents influences which must be monitored by research units in localities. Larger localities often devote part of their planning staff to monitoring state and federal programs which represent possible sources of fiscal transfers. Although their needs are often greater, the most rural counties have fewer such specialists available to them. The availability of such information for them rests on part-time legislators, who sometimes even resent government "hand-outs" in the first place.

Thus, in some ways the complexities of Figure 2 simply increase the number of variables which must be monitored in the system, but in other ways they represent qualitatively different phenomena. One implication of Figure 2 is that, since units at the higher level influence those at the lower level, the proper units of observation for the effects of some of their policies are the units beneath them. For example, the federal government makes money available and establishes offices for its agencies in inter-state regions, in state capitols, in intra-state regions, and in counties and localities. State governments also deal with all jurisdictions nested within them. For maximum understanding of the impacts of their policies, therefore, they should establish continuous monitoring operations on these units (cf. Sismondo, 1975, XIX).

IV. USEFULNESS OF THE PARADIGM FOR RURAL AND REGIONAL DEVELOPMENT.

The paradigms usefulness can be most easily assessed by considering it in relation to the three criteria for policy research initially established. Much hinges on the matrix presented in Table 1. If the matrix can be established with accurate and stable estimates of relations between the specified variables, then the system would very likely meet the required criteria. If it cannot, then the paradigm will be much less useful. Choice of variables and significant underlying theories are clearly critical determinants of the feasibility of such a matrix.

Reasonably accurate estimates of many of the relationships have been obtained using various statistical techniques. First, many of the cells contain zero coefficient -- they show no significant relationships. Second, it is relatively forthright to establish the direction of the sign of the statistical relationships, although it is more difficult to establish the size of the coefficients, b, beta, partial correlation, or R-square. Thorough reviews of research literature can often hypothesize if not firmly establish

the sign of the relation. In fact, one of the important values of research using this systemic paradigm is that it directs researchers to the findings of previous analyses in a routinized way in order to document expected relations between variables. The systemic paradigm depicted in Figure 1, again, is of considerable help in identifying viable theories and ordering variables to produce meaningful policy-oriented findings. It predicts that some programs-agencies-budgets will affect some structures, which in turn will affect resources, which, together, affect levels of well-being. In other words, the paradigm suggests directions of the determining influences, and should lead to more cumulation in theory building than has hitherto been the case within social science.

Third, many of the relations can be relatively accurately estimated through the accumulation of secondary data, i.e. data collected by others for other purposes mostly under non-research budgets.

In fact, data for the paradigm from such sources are not so difficult to collect that some tests of it can indeed start almost immediately. Tables 2 and 3 present matrices based on Table 1, with data for the 196 non-metropolitan (i.e. "rural" by USDA definition) counties from among the 300 Northeast U. S. counties. These counties have no center of population over 50,000 people in them and they are not officially considered as suburban to an SMSA in 1970.

Also, although statistical significance on this universe is relevant mainly to show the impact of given variables, the tables report only those betas which reach F-ratios above 1.0. For clarity in separating the more influential from the less influential betas, all other betas are reduced to zero. The "change measures" are calculated by subtracting 1960 levels from 1970 levels for Table 2, and by subtracting 1950 levels from 1960 levels for Table 3. Due to missing or non-comparable data for 1950, Table 3 is a reduced form of Table 2. Moreover, certain variables are in the form of Guttman scales. These scales are given in the appendix. (For general interpretation of the scales and other data, cf. Eberts, 1974, XV, and 1975, XXII.) Most of the variables in the matrices except the scales were collected from the County and City Data Books for the three points in time, 1950, 1960, and 1970. They are stored and processed under the auspices of the Data Bank for Social Accounting in the Department of Rural Sociology at Cornell, largely through the support of USDA-CSRS NE-47 and NE-89 regional research projects. Political mobilization refers to

Table 2. Standardized Beta Coefficients* Showing Influence of Certain Paradigmatic Variables as of 1960 Levels on Changes in them between 1960 and 1970, 196 Northeast U.S. Non-Metropolitan (i.e. "Rural") Counties.

Independent Variables = 1960 Levels

Dependent Variable	Budgets & Agencies			Institutionalized Structures																
				Fluidity				Linkage					Differentiation		Equality	Resources				
Δ1960–1970	Total P.C. Exp.	P.C. Hlth. & Hosp.	Plan'g Scale	# Elect. Co. Off.	Polit. Mobilization	Polit. Competition	Communication Scale	# Public Admin. Employees	# Mfg. Units 100+ Employ's	Total Coll. Enroll.	Trans. Link Scale	% Land Agric.	Commercial Diff.	Med. Spec.	Gini, Income	Med. Fam. Income	Pop. Size	Unemployed	R^2	Adj.** R^2
Budgets & Agencies																				
Tot. P.C. Expend.	.50	.08	0	.06	-.11	.17	-.10	.16	-.13	-.10	0	.07	.12	0	.15	.41	0	.10	.54	.49
Tot. P.C. Educ.	.41	0	0	.07	0	.09	0	[illegible]	-.14	-.09	0	.10	0	0	.14	.40	0	0	.38	.31
Tot. P.C. Welfare	.71	0	0	.11	-.19	.23	-.14	0	0	0	0	.10	0	0	.20	.18	0	0	.57	.52
Tot. P.C. Health & Hospital	0	.57	0	0	0	.16	0	0	0	0	.09	-.08	0	0	0	-.19	.03	-.14	.34	.26
Tot. P.C. Police	.18	.12	0	0	-.11	.15	-.18	.46	0	0	0	-.16	.21	0	.25	.39	-.38	0	.36	.29
Tot. P.C. Hiway	.45	0	0	.07	0	.12	-.22	.18	0	0	0	.12	.28	-.15	0	.16	0	0	.36	.28
Planning Scale	0	.07	-.64	0	-.13	.19	.15	0	0	0	.12	0	.28	.18	-.15	.21	0	0	.47	.41
Inst. Structs.																				
Fluidity:																				
# Elected Offs.	.14	0	0	-.94	.09	0	.08	-.16	-.11	0	-.04	.03	0	.05	.14	0	.26	0	.88	.87
Mobilization	0	0	0	0	-.35	.12	-.20	-.18	0	-.11	0	0	.29	0	.13	-.33	.45	-.09	.36	.28
Competition	0	0	-.15	0	-.38	-.30	-.13	.20	0	0	0	0	0	0	0	0	0	0	.28	.20
Commun. Scale	0	.09	.11	0	-.15	0	-.72	0	0	0	0	0	0	.43	0	0	0	0	.36	.29
Linkage:																				
# Publ. Admin. Employees	0	0	-.11	-.10	0	0	0	.68	0	0	0	0	-.09	0	.26	.40	0	0	.72	.69
# Govt. Employees	.09	.02	0	-.10	.03	0	0	.12	.12	0	.03	0	-.07	-.04	.12	.13	.81	0	.96	.96
# Mfg. Units 100+ Employees	0	0	0	0	0	0	0	.27	0	0	0	.12	.13	-.16	0	0	.45	0	.28	.20
Value Added Mfg.	0	.10	0	0	-.26	0	0	0	.17	-.12	0	.08	.12	.20	-.30	0	0	.13	.25	.17
Tot. Coll. Enroll.	.16	0	-.17	-.15	0	0	0	-.10	.57	.46	0	0	0	-.11	.07	-.11	.36	0	.78	.75
Transp. Scale [% Land Agric.]	0	.21	0	0	0	.13	.23	0	0	0	-.30	0	0	0	0	0	0	-.18	.19	.10
Differentiation:																				
Comm. Diff. Scale	-.14	0	0	0	-.11	0	.18	0	0	0	.13	0	-.80	.29	0	0	0	-.11	.35	.28
Medical Spec. Scale	.12	0	0	.16	0	0	0	.35	0	0	0	0	0	-.41	0	.20	0	0	.17	.08
Equality:																				
Gini, Income	.22	0	0	-.09	0	.10	-.26	0	-.21	.14	.11	-.07	0	.26	-.73	-.33	0	0	.45	.38
Resources																				
Med. Fam. Income	.08	0	.09	0	-.08	0	-.13	.35	0	.09	0	.27	-.13	0	.09	.77	-.35	0	.63	.59
Pop. Size	0	0	.13	-.07	0	0	-.14	.54	0	.14	.09	.07	-.22	0	.19	.81	-.65	0	.58	.53
% Unemployed	.06	-.02	0	0	.05	.04	0	-.05	-.07	0	0	-.04	.04	-.04	0	-.17	.14	-.99	.96	.95
% Poverty	-.13	-.13	0	0	.15	0	.23	0	0	0	0	-.18	0	0	0	.75	0	0	.58	.53
Med. Education	0	0	0	.08	-.19	.14	.12	0	0	-.23	0	.20	0	0	-.13	.37	0	0	.33	.27
Profess. Tech. Kindred	-.10	0	0	-.08	0	0	0	.29	0	.22	0	.19	0	0	.12	.49	-.33	.14	.29	.21
Social Well-Being																				
P.C. Homicide	0	-.10	0	-.10	0	0	0	0	.17	0	.10	0	0	0	0	-.19	0	0	.11	.01
P.C. Suicide	0	0	0	0	0	0	0	0	0	0	.11	0	0	0	0	0	0	-.12	.08	.03
P.C. Infant Mortality	0	0	-.29	0	0	0	.13	0	0	0	0	0	0	.18	-.14	-.20	0	0	.07	.04

* Beta Values, F>1.0

** Adjusted for degrees of freedom using all variables in the columns

Table 3. Standardized Beta Coefficients* Showing Influence of Certain Paradigmatic Variables as of 1950 Levels on Changes in them between 1950 and 1960, 196 Northeast U.S. Non-Metropolitan (i.e. "Rural") Counties.

Independent Variables = 1950 Levels

Dependent Variable	Budgets & Agencies			Institutionalized Structures														
				Fluidity				Linkage				Differentiation		Equality	Resources			
Δ1950-1960	Total P.C. Exp.	P.C. Hlth. & Hosp.	Plan'g Scale	# Elect. Co. Off.	Polit. Mobilization	Polit. Competition	Communication Scale	# Public Admin. Employ's	# Mfg. Units 100+ Employ's	Total Coll. Enroll.	Trans. Link Scale	% Land Agric.	Commercial Diff.	Med. Spec.	Gini, Income	Med. Fam. Income	Pop. Size	Unemployed	R^2	Adj. R^2**
Budgets & Agencies																		
Tot. P.C. Expend.																		
Tot. P.C. Educ.																		
Tot. P.C. Welfare																		
Tot. P.C. Health & Hospital																		
Tot. P.C. Police																		
Tot. P.C. Hiway																		
Planning Scale																		
Inst. Structs.																		
Fluidity:																		
[# Elected Offs.]																		
Mobilization	-.18		-.37	-.14	0	-.19	0	0	0	-.09	-.12	-.13	-.34	-.53	.36	.12	.49	.45
Competition	0		.11	-.61	0	.11	.15	-.18	0	0	.08	0	.19	.34	-.26	.08	.53	.49
Commun. Scale	.13		-.10	0	-.66	0	0	-.09	0	0	.31	0	0	.26	0	.12	.26	.19
Linkage:																		
# Publ. Admin. Employees	0		0	0	0	.76	.18	.13	0	0	0	0	0	-.15	0	0	.73	.71
# Govt. Employees																		
# Mfg. Units 100+ Employees	-.23		0	0	0	.23	.43	.16	0	0	0	0	0	0	0	0	.39	.34
Value Added Mfg.	0		-.15	0	.16	0	.41	-.22	.09	0	0	.22	0	0	-.55	0	.22	.15
Tot. Coll. Enroll.	0		.08	0	.26	.10	-.43	.73	.08	0	0	-.10	0	0	0	0	.53	.49
Transp. Scale	0		-.27	-.14	0	0	0	0	-.50	-.17	0	0	.23	0	0	0	.30	.24
% Land Agric.	-.15		-.15	-.19	0	0	.22	0	.12	-.18	0	.11	0	-.13	0	0	.17	.10
Agric. Prod.	-.29		0	-.17	-.14	0	.16	0	0	.17	0	.19	0	0	0	.10	.17	.10
Differentiation:																		
Comm. Diff. Scale	.24		-.13	-.07	0	-.23	0	-.12	-.11	0	-.58	0	.20	.40	.17	0	.30	.24
Medical Spec. Scale	0		.14	0	.28	.24	0	0	.10	0	.36	-.60	0	0	0	0	.32	.27
Equality:																		
Gini, Income	0		.15	.15	0	0	-.49	0	0	0	0	0	-.56	-.66	.45	0	.37	.32
Resources																		
Med. Fam. Income	0		0	-.16	0	.21	.33	0	0	0	0	0	0	.68	-.47	0	.54	.50
Pop. Size	0		0	0	-.10	.53	.24	.09	.07	0	0	-.08	.24	.58	-.55	0	.48	.44
% Unemployed	-.13		.23	.17	.21	-.19	-.18	0	0	0	-.17	-.10	.12	-.39	.50	-.08	.40	.35
% Poverty	0		.14	.23	0	-.30	-.56	0	-.13	-.09	0	0	-.10	.23	.84	0	.33	.28
Med. Education	-.26		-.07	-.13	0	0	.29	.11	0	-.12	-.14	0	.29	.82	-.25	0	.43	.38
Profess., Tech., Kindred	0		0	.08	0	0	-.33	.36	0	0	-.12	0	.19	.40	0	0	.33	.27
Social Well-Being																		
P.C. Homicide	0		-.16	0	0	0	.20	-.12	0	0	0	0	.24	.33	0	0	.07	.01
P.C. Suicide	0		.18	.12	.15	0	0	0	-.13	0	0	-.17	0	0	0	0	.12	.05
P.C. Infant Mortality	0		-.09	-.13	-.18	0	.14	0	.14	0	-.13	0	.14	.35	-.23	0	.14	.07

COMPARABLE 1950 DATA NOT AVAILABLE

* Beta Values, F>1.0

** Adjusted for degrees of freedom using all variables in the columns

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the percentage of the county electorate which voted in the 1952, 1960, and 1968 Presidential elections, and political competition refers roughly to the absolute score of one minus percentage voting Democratic minus .50 in those elections. Most other variables are straight-forward.

Both the independent and dependent variables are divided into the sub-groups of the paradigm presented in Figure 1. In addition, the Institutionalized Structures are further divided into the four categories of fluidity, linkage, differentiation, and equality according to four key concepts in systems theory (cf. Eberts and Sismondo, 1975, XX). Due to grossness of most data collected through secondary sources the various tiers in the multi-level paradigm of Figure 2 are collapsed. Still, all the items under fluidity, differentiation, equality, and resources are those which have their source in the local county. Some linkages are initiated from the local county to others, and these are not separated from those which were initiated from other counties to the local county as the multi-level paradigm would require. Nor are funds from non-local sources of expenditures under Budgets and Agencies separated from the local sources. These refinements in analysis must be left to further research.

In our judgment, the most significant pattern in Table 2 is the influence of the directly policy-manipulable variables on the other variables in the system. Assuming that local legislators can control total per capita expenditures in their jurisdictions (column one of Table 2), per capita expenditures for health and hospitals (column two), and their level on the Guttman scale of planning services (column three), then according to these data they can directly influence, to the limited degree specified by the beta, changes in all but four variables in the system. Only changes in political mobilization, number of manufacturing units with 100 or more employees, median education, and per capita suicides are not affected by these three variables. It should be noted, by the way, that the first three of these variables showing no influence in Table 2 were affected by the planning scale alone during the 1950-1960 decade, as indicated in Table 3. Only per capita suicide, therefore, has not been directly influenced by local government programs, budgets, and agencies as indicated simply through the three variables presented here. Of course, suicide rates are affected through variables which are directly policy-manipulable. Presumably a larger number or different variables of

this nature would have even further effects.

In this connection, the list of variables presented as dependent variables under Budgets and Agencies in Table 2 were subjected to a factor analysis, using their 1960 levels rather than change measures as the inputs. Three orthogonal factors were produced. The first factor demonstrated high loadings for all the expenditure items except per capita health and hospital; the second factor showed a high loading for the planning scale; and the third factor showed high loadings for per capita health and hospital. To avoid some issues in multi-collinearity in the regression analyses which produced Tables 2 and 3, therefore, only the highest loaded item on each of the three factors were included in the regression equations. Similar procedures were followed for each of the grouped items comprising the sets of independent variables in Tables 2 and 3.

The use of 1960 levels for the paradigmatic variables in correlation with changes in the variables between 1960 and 1970 has a triple effect of, first, meeting the "precedence in time" requirement for causal analysis; second, showing the incompleteness of the analysis because certain changes in the dependent variables are highly correlated with other simultaneous or precedent changes; and, third, raising some problems of collinearity because in most instances the single highest coefficient in nearly all regression equations is with the same variable measured at its 1960 (or 1950 in Table 3) level. This last point is easily recognized because any given row is the regression equation of standardized beta coefficients, with the R-square and adjusted R-square given in the last two columns of the matrices. Eliminating such redundant variables would undoubtedly considerably decrease the reported R-squares. Likewise, eliminating the insignificant variables would decrease the R-squares, but would also likely increase the size of some remaining beta coefficients. Those concerned with "exact size" of any given coefficient, therefore, have much remaining analytic work. Our judgment is that, as in most such statistical manipulations in regression, the relative rank ordering of the significant variables and the signs of the relations between the independent variables and the dependent variables will remain relatively constant throughout the various modifications and transformations of the equations. Consequently, for the present analysis no further statistical manipulations were performed. The relatively low explained variance indicates that further research is

readily needed, probably through adding new variables to those presented here.

On the other hand, in two out of three of the 29 dependent variables in Table 2 the explained variance in these raw equations reaches over thirty percent, and only the three social well-being variables show explained variance of less than 10 percent. Table 3 also demonstrates approximately the same ratios with its 22 equations. Although such equations as they stand would not be the basis of a very good simulation model, because they give the signs of directions in the relationships and some rank ordering of the relative influence of each variable, they do provide an initial framework from which to begin building such a model.

The notion of building a simulation model from these equations draws attention to a very important finding in the two tables, namely, that the two matrices are really quite different from one another. The most dramatic differences are in the influences of the number of manufacturing units with 100 or more employees, of percentage of county land in agriculture, and of political competition. Of the twenty-two reasonably comparable equations in both tables, manufacturing and political competiton are significant almost twice as often in 1950 as they are in 1960, while the percentage of county land in agriculture is significant only half as often. In addition, political mobilization is half again more important, and the communication scale half again as important in the 1950's than in the 1960's. The Gini index is calculated from income data in such a way that a high score indicates greater inequality. In other words, two vastly different processes seem to be working in the two decades.

One major implication of this finding is that policy decision based on theoretical models built on the basis of 1950 data would likely produce unexpected and inexplicable results if they would be applied in the 1960's. For instance, during the 1950's the number of manufacturing units in a county were very important in attracting other manufacturing units, in producing higher levels of family income, and in effecting greater political competition in the county. All three of these effects were reduced to insignificance during the 1960's. Such dramatic differences underscore the importance of constant monitoring both of the key variables themselves as well as of the theoretical models to which they contribute. Policies based on the conventional wisdom of a previous decade may be quite outmoded

and possibly produce disappointments from previously high expectations. In a rapidly changing society, new patterns of relations unexpectedly emerge, which have not been observed before, to upset the finest plans of mice and men. Vigilance through institutionalized research monitoring may not be a salvation, but it may be necessary to deter certain errors in decision-judgments.

If the differences in the models for the two decades hold up in further research, they could have far-reaching effects on comparative and historical social theory. If theoretical models built on data from one time period cannot be trusted to hold in another time period, then the most that can be expected from comparative and historical studies is to produce paradigms of variables to which social scientists must be sensitive in their on-going endeavors. Theories, and simulations based on them, therefore, could not be expected to demonstrate the precision of physical and chemical sciences. All theories must be checked for accuracy in the very process of their use. Theories themselves would become very general and less universalistic. The procedures and techniques for producing and using paradigms would become more important and may well usher in a new era in social theory.

The single most disappointing set of findings in Tables 2 and 3 are those on the social well-being indicators of suicide, homicide and infant mortality rates. Less than fifteen percent of the six indicators' variances are explained according to their R-squares. Much further research is needed in this area. The complete change of model in understanding the three indicators in the two decades, and the lack of responsiveness of infant mortality to health and hospital budgets and to the Guttman scale of medical specialties are particularly disturbing.

A final observation from Tables 2 and 3 is the importance of the two community resources of median family income and population size. Median family income is the top variable in the number of significant relationships in the two tables, and both of them demonstrate average beta coefficients of over .40 in the two tables. This is roughly 50 percent higher than their nearest competitors. Although they may not merit the publicity and attention they receive in public and scientific analyses, their effects cannot be disputed. In both cases, however, it should be noted that in this set of counties, the role of manufacturing firms in determining changes in income levels and population size is much

diminished in the 1960-70 data compared to the 1950-60 data, while the role of local agriculture has increased. Still, in both decades the places with higher incomes are the ones attracting more people and even more income, while the places with higher population levels are growing less rapidly in size and income. Such findings tend to underscore the differences between development strategies at national and at local levels.

Although the criteria for examining huge amounts of data vis a vis paradigms are nebulous, it is our judgment that these data demonstrate the usefulness of the paradigm. The sets of variables are interrelated. The more policy-manipulable variables, in the left-hand columns of Tables 2 and 3, are influential not only on each other, but also on a wide variety of structures and resources in the system, as well as on social well-being even if minimally. Moreover, the paradigm and the accompanying data show where further research is needed. Although many stimulating questions can be asked about the data and their analyses, to raise many of the R-squares and to chart more precisely the influence of the various policy-manipulable variables on the others seem immediately important in further action-oriented policy research.

In any case, from considerations like these, we are confident that producing a matrix meaningful to policy-makers is possible, and that its use can contribute more information at lower costs than the techniques used in other types of policy research. Such a matrix can focus much of the expensive survey work done in social science in order to resolve questions most needing resolution, and, if fully established, greatly reduce duplication. If systems analysis is an accurate format for policy research, then simulation is the most important part of it. But simulation depends less on the current distribution of a variable than it does on the coefficient (b, correlation, beta, or some other) accompanying the variable in its sets of relations with other variables. The systems approach emphasizes that it is the size of the relationship between the variables that is really important, and not the number of people involved in any particular social category. This is the reason for all the emphasis on estimating accurate relations between the variables in the matrix. Other forms of policy research tend to de-emphasize this fundamental assumption and hence detractingly shift attentions away from the critical issues.

Moreover, the systems matrix approach is useful to policy-makers because it enables them to understand more easily the "total set of relationships" (in our experience a matrix communicates better in diagrams with arrows as in path analysis, but this is an heuristic device). It also helps them realize their own role-position in these relationships, namely, what their policy options have been, and with approximately what (even if small) effects. Further, insofar as the influences are caught by the numbers in the matrix it helps them understand the nature of other key and dominant influences in the system, as well as how much is not known. In other words, the paradigm and the matrix help us to be as humble and as powerful as we realistically are in presenting our findings to policy-makers. On the basis of data arranged in paradigms like those above, social scientists are much less likely either to over-state or under-state their cases.

V. CONCLUSIONS.

In sum, we believe the multi-level systems policy research paradigm, and its accompanying data-matrix implications, can meet the three decision criteria established initially for consideration by rural social scientists, namely those of cost-effectiveness, policy-effectiveness, and social science effectiveness.

First, since it focuses needed research more precisely, this paradigm's use in research decisions could presumably allocate available funds more efficiently than alternative paradigms. It does not replace the other forms of policy research, but organizes them, puts them in perspective, and encourages inter-disciplinary research. Such organization should produce greater cost-effectiveness in using research monies, facilities, and talents.

Second, it would enhance policy effectiveness because, rather than react to social stimuli of the past such as often occurs in evaluative research, it suggests simulating (proacting) a future on the basis of known (even if changing) coefficients. It focuses on key issues of present and likely future effects of current and potential policies, which are the ones of primary concern to policy-makers. Its research reports, therefore, are less likely to gather dust on shelves. It demonstrates an explicit connection between the most sophisticated social research and policy research. In the paradigm it is not easy to separate "basic" research

from its "applied" policy implications. Virtually all social research, then, can be policy research.

Moreover, the continuous monitoring implied in the paradigm assures that some data on most of the key variables in the system including their recent and therefore probable trends will be available should current basic or applied needs arise. It can utilize new data with existing data and is therefore cumulative.

Third, because it emphasizes trend analysis on a wide range of interacting variables, it should make a major contribution to social science disciplines. The heart of the paradigm is the building and interpretation of accurate, general, and grounded theory. It questions previous results and seeks new models. It established a framework for cumulation of research results. It can use the most developed skills of the most talented social scientists. Finally, because the paradigm is applicable to a variety of system levels, it encourages inter-disciplinary activity, both from one field to another, and from professionals to semi-professionals. Thus, its use should spread social scientific perspectives and reasoning more widely throughout the population. Insofar as most of us understand how our science is helpful to people as they resolve their personal and collective problems, we cannot help but judge its wider dissemination to be beneficial.

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This paper may be conceived as one in a series explicating various aspects of a general political, economic, social and psychological theory of development. It is, as it were, an installment dealing with selected theoretical and empirical relations between policies, social structures and quality of life outcomes. Emphasis is given to units of analysis and interrelations between them.

Previous papers outlining other aspects of the general theory are listed below.

It is relevant to note that design criteria for development programs and for assessment systems have been specified in earlier papers -- namely, II, III, IV, V, XIV, and XVIII. Theoretical background in support of such research systems has been documented especially in papers numbered: I, VI, VII, VIII, X, XI, XII, XVI, XVII, AND XXI. Specific methodologies of assessment for development programs are explicated and illustrated in papers numbered: IX, XIII, XV, XIX, and XX.

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APPENDIX TABLES

THE GUTTMAN SCALES

Table One. Guttman Scale of Transportation Linkages for 300 Northeast U. S. Counties, 1950, 1960, 1970.

Order of Items	Item	1950 C. of Scal. = .75 Frequency	1950 Errors	1960 C. of Scal. = .77 Frequency	1960 Errors	1970 C. of Scal. = .73 Frequency	1970 Errors
1	Long Distance Trucking	243	48	255	18	260	16
2	Within County Railroad	177	0	148	0	151	2
3	Within State Railroad	157	6	133	13	133	18
4	Commercial or Freight Airline	88	43	87	42	88	41
5	Railroad Headquarters	68	11	67	31	69	34
6	5 or more Out of State Railroads (10+ in 1950)	30	21	32	9	44	16
7	Airline Headquarters	3	0	4	2	13	4

Table Two. Guttman Scale of Commercial Service Specialities for 1950, 1960 and 1970 for 300 Northeast Counties in the Twelve Northeastern United States.

Scale Step		1950		1960		1970	
		Frequency	Errors	Frequency	Errors	Frequency	Errors
1	Gas Station	300	0	300	0	300	0
2	Furniture Store	295	16	293	5	297	4
3	Jewelry	289	3	291	6	292	10
4	Wholesale Auto and Equipment	274	21	284	13	290	9
5	Wholesale Food	269	15	278	11	281	12
6	Commercial Printing	248	21	261	17	266	27
7	Music Store	238	40	250	29	253	27
8	Department Store	227	27	236	34	244	43
9	Radio Broadcasting	186	56	216	32	227	32
10	Taxicabs	177	35	200	29	206	39
11	Bookstore	151	33	165	23	181	30
12	Wholesale Drugs	104	19	112	24	108	18
13	Clerical Services	41	9	79	21	77	16
14	T.V. Broadcasting	12	5	56	11	58	15
15	Business Loan Service	7	3	14	0	23	4
16	News Syndicate	3	0	7	0	6	1
		Menzel's Coefficient of Scalability .68		Menzel's Coefficient of Scalability .72		Menzel's Coefficient of Scalability .67	

Table Three. Guttman Scale of Medical Specialities for 300 Northeastern U. S. Counties, 1950, 1960, 1970.

Order of Items	Item	1950 C. of Scal. = .83 Frequency	1950 Errors	1960 C. of Scal. = .84 Frequency	1960 Errors	1970 C. of Scal. = .84 Frequency	1970 Errors
1	Hospital	265	1	274	1	274	3
2	Surgery	172	21	226	6	236	5
3	Radiology	149	19	198	22	205	18
4	Opthamology	127	22	180	24	181	20
5	Obstetrics & Gynecology	108	18	161	12	166	15
6	Urology	94	14	139	19	146	19
7	Orthopaedic Surgery	83	10	127	6	135	10
8	Dermatology & Syphilology	67	9	94	15	107	17
9	Neurological Surgery	31	6	68	5	79	10
10	Plastic Surgery	24	5	48	5	61	10
11	Physical Medicine & Rehabilitation	19	12	41	16	48	13
12	Colan and Rectal Surgery	15	5	31	8	34	6
13	Therapeutic Radiology	12	10	23	12	26	13
14	Allergy	11	5	18	4	22	4
15	Psychiatry and Neurology	4	2	15	7	16	12
16	Pediatric Cardiology	---	--	8	2	14	7
17	Radium Therapy	2	0	5	4	9	5
18	Clinical Microbiology	---	--	4	3	5	3
19	Hematology	---	--	4	2	2	3

Table Four. Guttman Scale of Planning Specialities for 300 Northeast U. S. Counties, 1950, 1960, 1970.

Order of Items	Item	1950 C. of Scal. =.825 Frequency	Errors	1960 C. of Scal. =.814 Frequency	Errors
1	Chamber of Commerce	248	0	284	10
2	Any Development Organization	---	--	232	10
3	Urban Renewal Agency or Housing Agency	95	12	154	25
4	Public Planning Board	73	8	135	17
5	AIP-AIDC Membership	51	21	116	31
6	Urban Renewal Project, Any Stage	35	9	94	9
7	Planning Director	18	7	50	7
8	Urban Renewal Project, One Completed, Second in Any Stage	---	--	15	0

Order of Items	Item	1970 C. of Scal. = .69 Frequency	Errors
1	Chamber of Commerce	280	14
2	Any Development Organization	237	19
3	Urban Renewal Agency or Housing Agency	191	3
4	AIP-AIDC Membership	172	11
5	Urban Renewal Project, Any Stage	160	32
6	Public Planning Board	142	10
7	Urban Renewal Project, One Completed, Second in Any Stage	114	22
8	Planning Director	89	1

Table Five. Guttman Scale of Communications Specialities for 300 Northeast U. S. Counties, 1950, 1960, 1970.

Order of Items	Item	1950 C. of Scal. =.800 Frequency	Errors	1960 C. of Scal. =.972 Frequency	Errors	1970 C. of Scal. =.931 Frequency	Errors
1	Radio Station	167	37	241	4	229	16
2	Newspaper Circulation of 10,000+	134	3	145	3	159	3
3	Two or More Newspapers	109	3	109	10	109	12
4	Television Station	10	0	56	9	55	6
5	News Syndicate	2	0	7	0	5	1